



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D205-596-105
Job Sheet 173827



Part No: D205-596-105

Job Qty: 1 ea

Part Name: Fwd Crosstube - Extended Height 31"



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 3/7/18

Job Tracking No:

Due Date: 4/13/18

Created By: Linda Lacelle

Type: Stock

Description:

Note: D205-596-105 REV.C IPP Rev:D 05.03.21 Added bending procedure KJ/JLM IPP Rev:E 08-01-10 ECN 1075 DD IPP Rev F 08.04.28 Added bending & mat'l EC verified by: DD IPP rev G 10.05.27 chg QC15 to QC6 EC verified by: DD IPP REV:H 13.11.29 as per dwg DEO B-2 DD VERF:JLM IPP REV:I 18.02.08 AS PER DWG REV.C DD VERF:JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	4/12/18	4/12/18	0.00	0.00	Start Up Crosstubes-1		GP
105	HandFXtube	1 pcs	4/12/18	4/12/18	0.00	0.51	HandFinish5		GP
107	QC	1 pcs	4/12/18	4/12/18	0.00	0.00	QC7-1		JW
110	CNC Bend Crosstubes	1 pcs	4/12/18	4/12/18	2.55	0.00	CNC Bend Crosstube		GP
130	QC	1 pcs	4/12/18	4/12/18	0.00	0.00	QC15		JW
140	Crosstubes	1 pcs	4/12/18	4/12/18	0.00	1.37	Crosstubes-1		GP
150	HandFXtube	1 pcs	4/12/18	4/12/18	0.00	0.51	Crosstubes-3		GP DAB
155	QC	1 pcs	4/12/18	4/12/18	0.00	0.00	QC7-1		38 DAB
160	QC	1 pcs	4/12/18	4/12/18	0.00	0.00	QC5		9-85 38
170	SprayPaint	1 pcs	4/12/18	4/12/18	0.00	2.03	Spray Paint		MAR 29 2018
180	QC	1 pcs	4/12/18	4/12/18	0.00	0.00	QC14		APR 04 2018
190	Crosstubes	1 pcs	4/13/18	4/13/18	0.00	1.37	Crosstubes-1		2FS
200	QC	1 pcs	4/13/18	4/13/18	0.00	0.00	QC5		
205	DC	1 pcs	4/13/18	4/13/18	0.00	0.00	DC		
210	Packaging	1 pcs	4/13/18	4/13/18	0.00	0.00	Packaging3-1		Smrs
220	QC21-FG	1 Ea	4/13/18	4/13/18	0.00	0.00	QC21		DAB 21 MAY 02 2018

Part Op 105 - INSIDE AND OUT

Descriptions: 110 - Bend as per Dwg D2889 using CNC bender program

140 - 1-Cut as per Dwg D205-596-105 2-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Polish cut surface. Scribe part # and batch # on one end of tube.

150 - ***IMMEDIATELY AFTER GRINDING***

170 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** 1-Prime inside and outside as per dwg and per QSI 005 4.1 Batch: _____ 2- Paint outside per QSI 005 4.2 Batch: _____

190 - 1- Lightly scuff the bonded area using a 180 grit sand paper and clean the area with 41058 wash 'n' wipe 2- Apply Proseal as per dwg D205-596-105. 3- Install clamps as per dwg (Note 12) Torque clamps 80 to 100 in-lb as per dwg and Note 13) 138784 exp 9/18

200 - ***PRIOR TO PACKAGING RECHECK TORQUE ON CLAMPS AFTER PROSEAL HAS CURED 72HOURS.***

205 - Photocopy D205-594 bluefile & type labels per PPP D205-596-105 CHG003

210 - Identify and pack for shipping as per PPP D205-596-105

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

Job BOM				
Part / Item	Component Name	Quantity	Operation	Container
D6005-180	Crosstube Material	1 Ea (1 ea)	90-Start up Operation	
D2893-1	Support	2 Ea (2 ea)	190-Crosstubes	
D3595-063-450	Rubber Cushion 0.63" Wide X 4.50" Long	4 Ea (4 ea)	190-Crosstubes	
MS21920-25	Clamp	4 Ea (4 ea)	190-Crosstubes	
Primer # M138687				
Paint # 138793				
Job Allocations				
Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D6005-180	1	20	0
190-Crosstubes	D2893-1 5051388	2	7	0
	D3595-063-450 5048868	4	9	0
	MS21920-25 5024697	4	108	0
Part Specifications				
Specifications could not be found.				

Plex 3/7/18 1:49 PM dart.lacelle.linda

DART
AEROSPACE

Container No: S051109

Part: D205-596-105

Job No: 173827

Serial No/Batch: S051109

Revision: C

Inspector:

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Date: 03/14/18

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval 	
Description Work Order Deviation		Disposition			
				Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	

Root Cause				FAULT CATEGORY			
Environment ☐		No Re-verification ☐		Pressure/Forced ☐		Temperature/Cure ☐	
Design ☐		Operator ☐		Bending ☐		Set-up ☐	
Doc/Data ☐		Offset/Setup ☐		Centre Not Concentric ☐		BOM/Route ☐	
Equip/Tooling ☐		Supplier ☐		Cracks ☐		Broken/Damage/Defect ☐	
Handling/Pre ☐		Training ☐		Crimp/Kink/Ripple/Wave ☐		Inspection Incomplete/Unqualified ☐	
Material ☐		Use for Testing ☐		Cuffs ☐		Contamination ☐	
Internal Transport ☐		Poor Information ☐		Crushing ☐		Countersink ☐	
Tribal Knowledge ☐		Rushing ☐		Heat Treat ☐		Cut Too Short ☐	
LOA ☐		Product Improvement ☐		Wave/Twist in Tube ☐		Instructions Incomplete/Unclear ☐	
Substation ☐		Process Improvement ☐		Marks/Chatter ☐		Drill Holes ☐	
Past Expiry Date ☐		Manufacturing Process ☐		OTHER : _____			
Misidentified ☐		Past Due ☐					

SHOP COPY

RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT

WITHOUT NOTICE
WORK ORDER
NO. 173827

MAR 07 2018

PARTS LIST:

ITEM	QTY -105	QTY -105B	PART NUMBER	DESCRIPTION
	X		D205-596-105	CROSSTUBE ASSEMBLY, HI-HI FWD
		X	D205-596-105B	CROSSTUBE ASSEMBLY, HI-HI FWD, 214
1	1	1	D6005-180	CROSSTUBE
2	2		D2893-1	SUPPORT
3	4	4	D3595-063-450	RUBBER CUSHION
4		2	D5018-1	SUPPORT, 214 AFT
5	4	4	MS21920-25	CLAMP
6	A/R	A/R	PROSEAL 890 B-2	SEALANT (OR AMS-S-8802 CLASS B-2)

GENERAL NOTES:

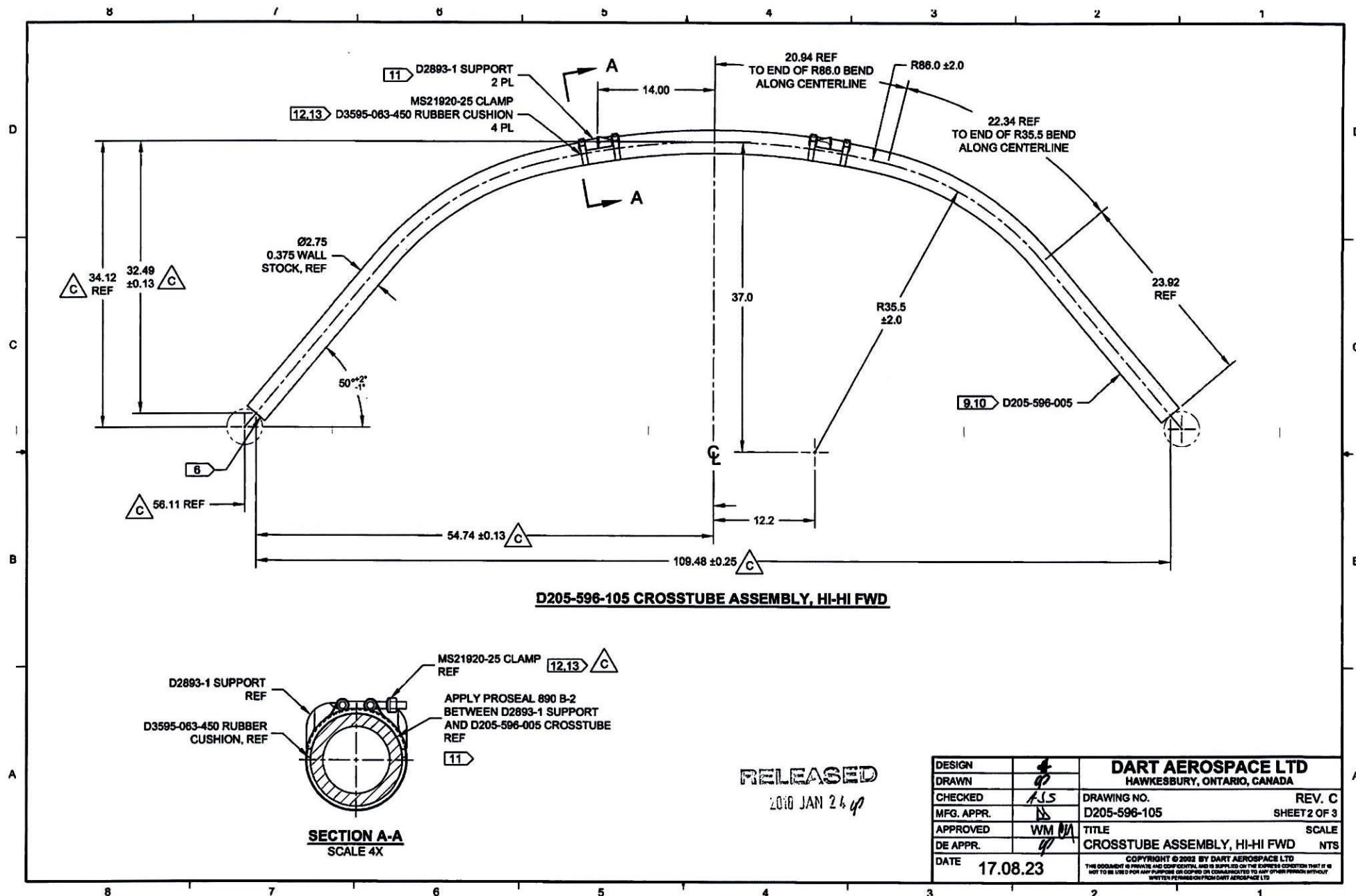
- 1) MATERIAL: MANUFACTURE FROM D6005-180
FINISHED LENGTH = 134.40 ± 0.02
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS
- 7) WEIGHT: 40 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE
- 9) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 8% BASED ON O.D.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) TO INSTALL D2893-1 / D5017-1 SUPPORTS: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 12) INSTALL MS21920-25 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE D2893-1 / D5017-1 SUPPORT. ENSURE CLAMP MECHANISMS ARE ON TOP SIDE OF CROSSTUBE.
NOTE: IT IS ACCEPTABLE TO SUBSTITUTE MS21920-25 CLAMPS WITH LONGER (MS21920-28) OR SHORTER (MS21920-24) CLAMPS TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

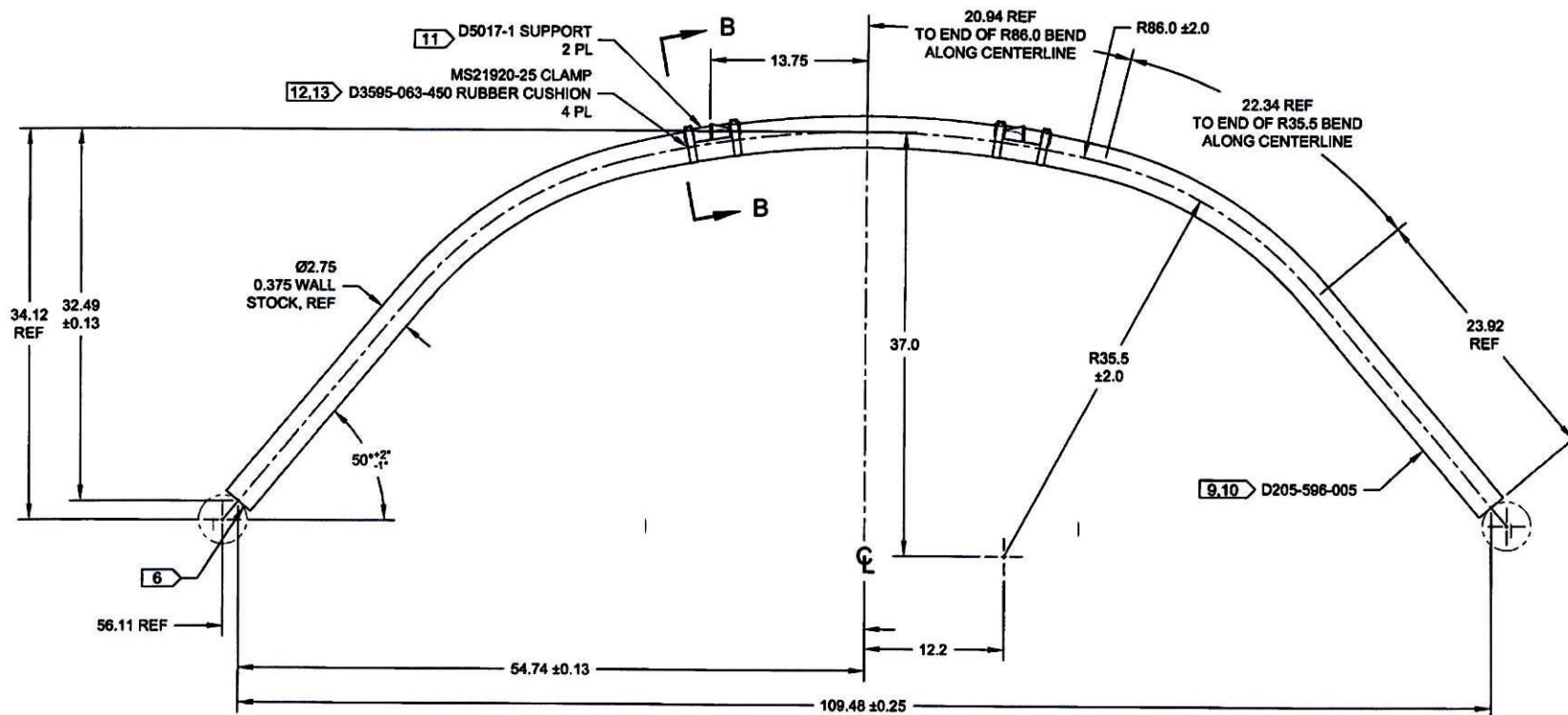
RELEASED

2018 JAN 24 4P
ECN 18-525

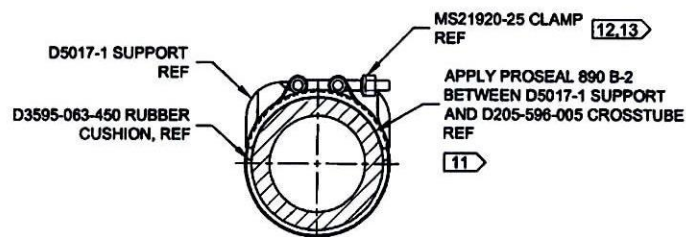
C	REFORMAT, ADD SHT 3, HEIGHT/WIDTH DIM & TOL CHG, ADD TOTAL WIDTH DIM (B4-2, B4-3, CLAMP ORIENTATION FLIPPED (A5-2, A5-3), INCORP ALL DEO'S	CP	17.08.23
B	SUPPORT NOW MAGNOBONDED; REMOVE D2856-600-861 ABRASION STRIP; UPDATED NOTES; ADDED D3595-063-450 CUSHION; MS21920-25 WAS MS21920-24	MB	07.12.03
A	NEW ISSUE	DS	02.11.20
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	17.08.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D205-596-105	REV. C SHEET 1 OF 3
TITLE CROSSTUBE ASSEMBLY, HI-HI FWD	SCALE NTS
COPYRIGHT © 2005 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	





D205-596-105B CROSSTUBE ASSEMBLY, HI-HI FWD, 214 C



SECTION B-B
SCALE 4X

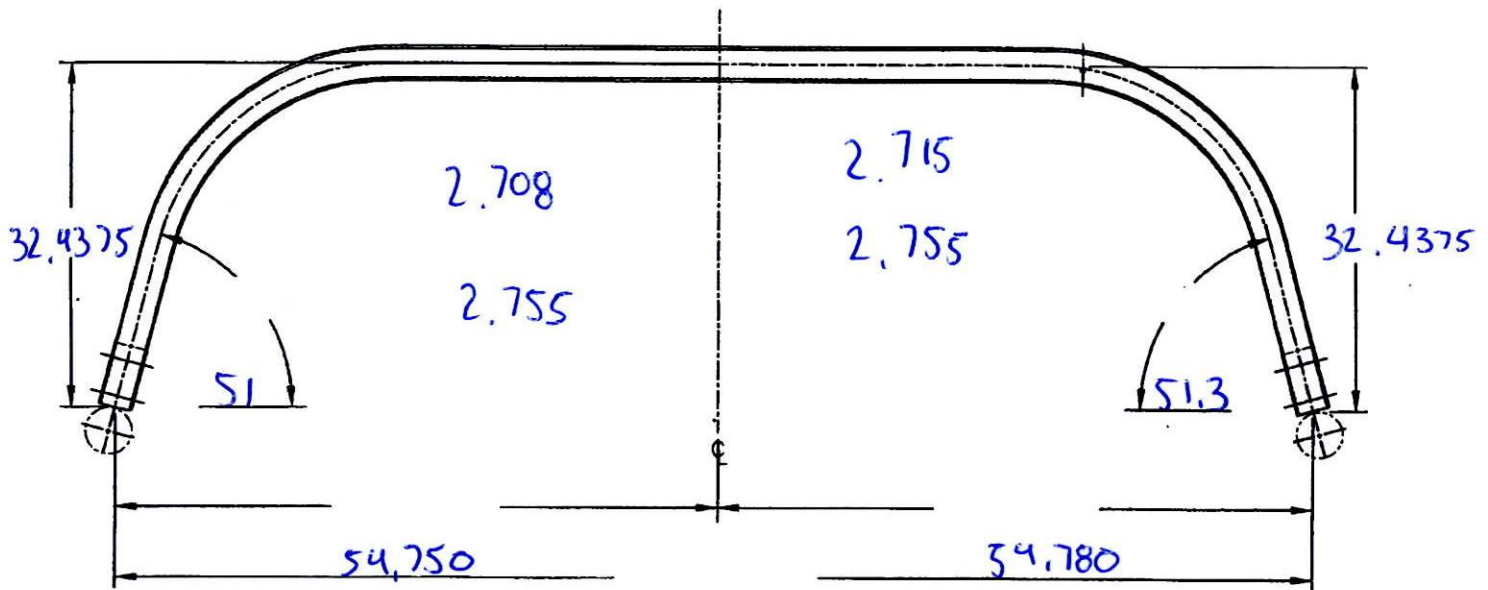
RELEASED
2018 JAN 24

DESIGN	4	DART AEROSPACE LTD	
DRAWN	9	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ALS	DRAWING NO.	REV. C
MFG. APPR.	DS	D205-596-105	SHEET 3 OF 3
APPROVED	WM	TITLE	SCALE
DE APPR.	11	CROSSTUBE ASSEMBLY, HI-HI FWD	NTS
DATE	17.08.23	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DART AEROSPACE LTD		Work Order: 173827
Description: Crosstube High-High Fwd		Part Number: D205-596-105
Inspection Dwg: D205-596-105	Rev: B <i>fc</i>	Page 1 of 1

DAS
10
9-89

Required Dimension	Min	Max
Height	32.4	32.6
1/2 Span	54.6	54.8
Angle	49	52
Total Span	109.2	109.6
Bending Passes	3	--
Crushing	--	6%



	Side A	Side B
Bending Passes	20	20
Crushing	0.9%	0.7%
Comments		

QC15 Inspection	<i>JL</i>
Date	18-03-15

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	
C	12.04.16	Added bending, crushing dimensions	KJ	<i>up</i>

Change Record

PAGE 1 OF 1

Part Number: D205-596-101/-103/-105/-107

Description: CROSSTUBE ASSEMBLIES[illegible]

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
670-4049 4434049				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					